

# INDIA WEATHER REVIEW, 1965

## ANNUAL SUMMARY

### PART-C

## STORMS AND DEPRESSIONS

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1965

### DEPRESSIONS AND CYCLONIC STORMS

During the year, 5 cyclonic storms and 7 depressions formed in the Bay of Bengal and one cyclonic storm in the Arabian Sea. In addition to the above systems, a land depression developed over west Madhya Pradesh. The tracks of the storms and depressions are given in Fig.I. The dates of activity of the storms and the greatest barometric depths observed (or estimated) near their centres are summarised in the following table:

TABLE I

Locality	Month	Date	Greatest observed (or estimated) barometric depth (mb)
Bay of Bengal	May	9 -12	25
Bay of Bengal	May -June	26-1	20
Bay of Bengal	November	4 -9	—
Bay of Bengal	December	6 -15	34
Arabian Sea	December	5 -12	—
Bay of Bengal	December-January	29-3 Jan.66	20

The monthly distribution of the storms and depressions for the year 1965 is given in Table II at the end.

The detailed description of the systems is given below:

1. Severe cyclonic storm in the Bay of Bengal—9 to 12 May.—

On the morning of 7 May, a low pressure area formed over the south-west Bay of Bengal. Associated upper air cyclonic circulation was noticeable upto 2.0 km a.s.l. Ceylon stations recorded rain and there was general fall of pressure over Ceylon and southern parts of the Peninsula. Actually an upper air cyclonic circulation was noticeable over the area in the lower levels even on 6th May. By the morning of 8th May, the low was well marked with two closed isobars and with circulation extending upto 4.0 km.

# **National Oceanic and Atmospheric Administration**

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September 14, 1999

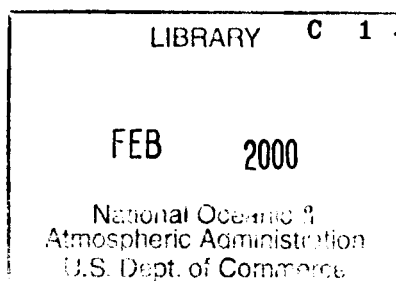
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C O N T E N T S

I   Depressions and Cyclonic Storms



0 28

Name of the Ship/station	Time of Obsn. IST	Position		Wind		Weather
		Lat. °N	Long. °E	Dir.	Speed Knots	
S.S.Aqva	0530	8.9	83.6	WNW	20	Drizzle
S.S.Safrain Arab	1130	7.6	82.6	NW	20	—
S.S.Kara		12.2	84.4	E	5	Rain

By the evening of 8th, the cyclonic circulation extended to 500 mb. It moved northnortheastwards and lay on the morning of 9th over southwest Bay and adjoining west central Bay of Bengal. By the evening of 9th, the system concentrated into a depression and lay centred near Lat. 13.5°N, Long. 85.5°E.

Upper air circulation extended to 300 mb and the anti-cyclone over it at 200 and 150 mb was well marked. Tires - IX photographs at 09 0606 GMT showed heavy overcast clouds in the region, with some organisation. Moving northnortheast, the depression became deep by 1800 GMT of 9th and lay with its centre near Lat. 14.5°N, Long. 86.0°E. Relevant ships' Observations are given below:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Wonorato	2330	14.2	85.1	998.6	NW	25	Overcast
S.S.Sutlej		14.8	87.3	994.0	SSW	35	Rain

Moving northnortheast the system intensified into a cyclonic storm by 0830 hrs IST of 10th and lay near Lat. 16°N, Long. 86.5°E. The relevant ships' observations at 100530 IST are:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Wonorato	0530	15.2	85.6	995.2	NW	20	Continuous rain
S.S.Jahangirbad	0530	13.5	86.0	999.0	SW	20	Overcast
S.S.Vwyp	0530	15.6	87.7	988.5	S	40	Drizzle

At 1130 hrs IST S.S.Wonorato (Lat. 15.5°N, Long. 85.9°E) reported northwesterly 30 knots and rain. The same ship at 1430 hrs IST (Lat. 16.2°N, Long. 86.3°E) reported westerly 30 knots. At 1130 hrs IST a ship Vwjl at Lat. 15.6°N, Long. 88°E reported southerly 40 knots and a pressure 989.5 mb.

Tiros - IX photographs at 10 0557 GMT reported tropical vortex centre not well-defined near Lat. 17°N; Long. 86°E. The picture showed bandings and cirrus outflow.

Moving in a north-north-easterly direction, the storm lay near Lat. 17°N, Long. 87°E by 10 1730 hrs IST. The upper winds of Orissa and north Andhra coasts also strengthened considerably. The relevant ships observations are:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed	
S.S.Wanorato	1730	16.4	86.4	995.7	W	30	Rain in Sight
S.S.Sutlej	1730	15.0	88.0	994.3	SW	35	-do-
Vwps	1730	16.1	91.0	1000.8	SSW	25	Squall

At this stage thunderstorm activity started over Gangetic West Bengal, east Pakistan and Assam. Moving north-north-eastwards the storm lay over north Bay centred near Lat. 19.0°N, Long. 88°E by 0830 hrs IST on 11th May.

Tiros - IX photographs at 11 0547 GMT showed this as a tropical vortex near Lat. 20°N, Long. 89°E and the eye was visible. At 1130 hrs IST on 11th the storm was declared as severe cyclonic storm with a core of hurricane winds. The relevant observations at 11 0600 GMT are:

Name of the Ship/station	Position		Pressure (mb)	Wind	
	Lat. °N	Long. °E		Dir.	Speed Knots
Sagar Island			997.6	NNE	40
Mvso Travancore-Cochin	18.8	86.0	1005.5	N	30
S.S.Wanorato	17.9	86.7	1001.2	NW	20
S.S.Saudi	16.6	88.9	1000.1	SW	30

Continuing to move north-northeastwards, the storm lay centred near Lat. 21°N, Long. 89°E at 11 1730 hrs IST. At this time, the upper winds of Calcutta and Chittagong were 30 - 40 knots. The severe cyclonic storm with a core of hurricane winds crossed East Pakistan - West Bengal coasts near Long. 89-90°E during 11-12 night. Thereafter moving north-northeastwards it weakened rapidly. It lay on the morning of 12th as a cyclonic storm over south Assam and adjoining East Pakistan with its centre at 0830 hrs IST near Agartala. By the evening of the same day it weakened and broke up over the Assam hills.

Under its influence, there was good thunderstorm activity over the Bay Islands on 7th and 8th and over the extreme south Peninsula and Ceylon on 7th and over West Bengal, East Pakistan and Assam from 10th to 13th. A few heavy to very heavy falls were reported from stations in East Pakistan on 12th.

## 2. Severe cyclonic storm in the Bay of Bengal—26 May to 1 June—

On some days during the course of this storm, the data are too inadequate to locate the centre with confidence.

On the morning of 24th May, there was widespread rain over the Bay Islands. A low pressure area formed over the east central Bay and adjoining southeast Bay. At 1130 hrs IST of the same day, the ship Vwrb (Lat. 14.2°N, Long. 87.4°E) reported eastnortheasterly wind of 5 knots and the Apj Akash (Lat. 9.9°N, Long. 87.5°E) northeasterly wind of 25 knots and Port Blair southwesterly wind of 15 knots, indicating that the low pressure area persisted over the area. At 0530 hrs IST of 25th the ship Apj Akash (Lat. 11.6°N, Long. 89.8°E) reported southwesterly wind of 20 knots and drizzle and the ship Vwps (Lat. 13.8°N, Long. 88.3°E) reported southeasterly wind of 15 knots and the pressure over the north Bay Islands was rising. The above facts suggested that on the morning of 25th the low pressure area had shifted west and lay over the southern parts of central Bay and adjoining south Bay and was well marked. Upper air cyclonic circulation extending upto 3.0 km a.s.l. was noticeable over the area. Tiros - IX pictures at 25 0533 hrs GMT showed a tropical vortex near Lat. 13°N, Long. 88°E. On the morning of 26th most of the stations over the Arakan and of Deltaic Burma reported rain. Pressure over the north Bay Islands and over Burma started falling and the upper winds of Port Blair veered from southsouthwest or southwest to westsouthwest and strengthened indicating that the well marked low pressure area has concentrated into a depression over the central Bay of Bengal with its centre near Lat. 15°N, Long. 89°E at 0830 hrs IST of 26th. The following ships observations at 0530 hrs IST are relevant:

Ship	Position		W i n d	
	Lat. °N	Long. °E	Direction	Speed (Kt)
Aqlj	13.2	86.4	W	25
Vwps	14.3	92.2	SSE	15

Port Blair reported wind speed of 40 knots at 1.5 and 2.1 km a.s.l. Tiros - IX Pictures at 26 0524 GMT showed it as a disturbed area. At 1130 hrs IST of 26th, the ship Safinae Barkat (Lat. 12.6°N, Long. 86.2°E) reported northerly wind of 30 knots. By the evening of the same day, the depression on probably remained stationary centred at 1730 hrs IST near Lat. 15.0°N, Long. 89.0°E. Upper air cyclonic circulation extended to 500 mb. Moving in a northnortheasterly direction and further intensifying, the depression lay over the east central Bay as a deep depression on the morning of 27th with its centre at 0830 hrs IST near Lat. 15.5°N, Long. 89.5°E. At 1130 hrs IST of 27th,

a ship Aqld at Lat. 13.2°N, Long. 85.5°E reported westnorthwesterly wind of 35 knots and moderate to very rough sea and moderate to heavy swell. However, Tiros - IX picture at 27 0514 hrs GMT showed only broken to overcast clouds in the area. Continuing to move slowly northnortheastwards, the depression was centred at 0830 hrs IST of 28th near Lat. 16.5°N, Long. 89.5°E. Tiros - IX photographs at 28 0509 hrs GMT showed a disturbed area with apparent centre around Lat. 15°N, Long. 87°E. On the morning of 29th, the system was centred near Lat. 17.5°N, Long. 90.0°E. At 1130 hrs IST of 29th SS Mansoor (Lat. 16.2°N, Long. 88.2°E) reported westerly wind of 35 knots and squall and the ship MV Andamans (Lat. 17.6°N, Long. 88.5°E) reported northerly wind of 15 knots. Remaining practically stationary till the morning of 30th, the deep depression intensified into a cyclonic storm during the night of 29-30th and was centred at 0830 hrs IST of 30th near Lat. 17.5°N, Long. 90.5°E.

The following ships' observations are significant in this connection:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Ohyama Maru	0530	16.1	91.1	990.0	WSW	40	Overcast
S.S.Mansoor	0530	17.6	89.4	990.0	N	25	Overcast Squall

At 1430 hrs IST, S.S.Ohyama Maru (Lat. 16.7°N, Long. 90.9°E) reported westsouthwesterly wind of 47 knots indicating that the cyclonic storm had further intensified into a severe cyclonic storm. At 1730 hrs IST, the severe cyclonic storm was centred near Lat. 18°N, Long. 90.5°E. In this connection the following ships' observations on 30th are relevant:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Ohyama Maru	1730	16.7	90.7	992.0	W	35	-
S.S.Mansoor	1730	18.8	90.0	993.0	NE	30	Squall
S.S.Saudi	1730	14.9	93.0	997.3	WSW	30	-
S.S.Bagha Karachi	1730	20.4	90.4	994.0	ESE	25	Height of Wave 9 ft.

Moving slowly northwards during the night, the severe cyclonic storm was centred at 0830 hrs IST of 31st near Lat. 19.5°N, Long. 90.5°E. Relevant ships' observations on 31st are quoted below:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Mansoor	0530	19.9	90.2	990.0	NE	45	Heavy rain
S.S.Ohyama Maru	0530	17.0	90.1	996.8	SW	35	Overcast
S.S.Mvso Assam	0530	21.4	91.6	995.7	ESE	25	-

At 1130 hrs IST, S.S.Aagtekerk (Lat. 20.0°N, Long. 89.2°E) reported northwesterly wind of 45 knots and heavy thunderstorm confirming that the cyclonic storm was still of severe intensity. Continuing its slow northward movement, the severe cyclonic storm was centred at 1730 hrs IST near Lat. 20.5°N, Long. 90.5°E. It crossed East Pakistan coast near Long. 90.5°E in the early hours of 1st June and weakened rapidly. On the morning of 1st it lay as a depression over East Pakistan with its centre about 50 km south of Mymensingh. During subsequent 24 hours, it weakened further and filled up over Assam by 2nd June.

Under its influence, the southwest monsoon advanced into southeast Bay and extended northwards into the eastern parts of east central Bay and northeast Bay. In the initial stage, it caused fairly widespread rain over the Bay Islands, Arakans and Deltaic Burma. It was also responsible for fairly widespread rain in Assam, Sub-Himalayan West Bengal from 30th May to 2nd June. Shillong recorded 8 cm of rain and Haflong 5 cm on 1st June and Shillong 8 cm and Pasighat 5 cm on 2nd.

### 3. Deep depression in the Bay of Bengal—13 to 15 July—

On the morning of 11th, the axis of the monsoon trough extended to north Bay of Bengal and was seen upto 500 mb. On the morning of 12th upper air circulation extending to 500 mb was noticeable over the north Bay. An odd isobar could be drawn at the surface. On the same evening, there was fall of pressure over the Orissa - Andhra coast while the pressure over the Chittagong - Burma coasts was rising. Weather belt also shifted to the west indicating that the low pressure area had moved slightly to the west and lay over the north Bay and was well marked. Port Blair reported westerly wind of 50 knots at 3000' and Akyab southeasterly 40 knots at 3000'.

By the next morning the well marked low pressure area concentrated into a depression over northwest Bay with its centre at 0830 hrs IST of 13th near Lat. 18.5°N, Long. 87.5°E. In this connection, the following observations of 13th are relevant:



Name of the Ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S. Phcw(Roepat)	0530	17.2	86.1	993.0	W	30	Continuous rain
Sandheads	0830			994.8	E	15	-
Sagar Island	0830			995.8	ENE	20	-
Puri	0830			995.7	N	10	Overcast

With the formation of the depression, there was widespread rain over Orissa and Andhra Pradesh. The upper winds along Orissa coast veered from northwest to northnortheast and strengthened while the northwesterly or northerlies along Andhra coast strengthened. At 1130 hrs IST, the ship S.S.Green Lake (Lat. 18°N, Long. 85°E) reported westerly wind of 20 knots and S.S.Bharat Kesari (Lat. 18°N, Long. 86.8°E) westsouthwesterly wind of 25 knots, confirming that the depression had not moved yet. It remained practically stationary till the evening. The following ships' observations at 1730 hrs IST of 13th are relevant:

Name of the Ship/station	Position		Pressure (mb)	Wind	
	Lat. °N	Long. °E		Dir.	Speed Knots
S.S.Bharat Kesari	18.6	87.3	988.8	NE	10
S.S.Kcwz	19.0	86.0	990.2	NE	25

The upper winds at Bhubaneswar were 30 knots eastnortheasterly at 5000' at 1730 hrs IST of 13th. So at this time it was a deep depression. The following observations are also signification:

Name of the Ship/station	Date	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather
			Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Green Lake	13/7	2030	19.7	86.3	990.9	NNE	25	Rain with-in sight.
Sandheads	14/7	0130			994.2	SE	20	-

Moving in a westnorthwesterly direction without further intensification the deep depression lay on the morning of 14th centred at 0830 hrs IST close to south Orissa near Lat. 19.0°N, Long. 85.5°E. The following observations on 14th are significant in this connection:

Name of the Station	Time of Obsn. IST	Pressure (mb)	W i n d		Weather
			Direction	Speed Knots	
Puri	0830	991.9	E	15	Intermittent rain
Gopalpur	0830	991.2	N	5	Continuous rain

At this time a maximum pressure departure of  $-9$  mb was recorded.

Gopalpur recorded the lowest pressure on Orissa coast. Continuing to move westwards, the deep depression crossed south Orissa coast near Gopalpur by the same evening and was centred at 1730 hrs IST about 100 km west of Gopalpur. Thereafter, the system moved westnorthwestwards during the night, weakened and lay on morning of 15th as a depression over west Madhya Pradesh and adjoining Vidarbha, centred about 100 km southwest of Kanker. Moving rapidly north-westwards, it was centred near Indore on the evening of the same day and weakened into a well marked low pressure area and lay over southeast Rajasthan and adjoining Madhya Pradesh on the morning of 16th. By the next morning it weakened further and merged into the seasonal trough of low pressure.

The estimated lowest pressure and the corresponding departure from normal during the entire life period of the deep depression were 990 mb and  $-10$  mb respectively at 0830 hrs IST of 14th July.

Under its influence, the monsoon activity which had been generally feeble revived over the north Peninsula and the monsoon whose northern limit was passing through Naliya and Delhi extended further to cover the entire country on 17th. Well distributed rainfall also occurred in Punjab and west Uttar Pradesh and Gujarat State. Some of the noteworthy amounts of heavy falls are: Nander 18 cm, Bidar 17 cm, Ratnagiri 16 cm, Karwar 15 cm, Nizamabad 14 cm on 15th, Santacruz 37 cm, Dahanu 29 cm on 16th and Broach 22 cm, Dahanu, Ludhiana and Patiala 15 cm each and Vallabh Vidyanagar 13 cm on 17th.

#### 4. Deep depression in the Bay of Bengal—26 to 28 July—

On the morning of 24th, the monsoon trough on sea level chart extended into the northwest Bay of Bengal. There was a comparatively large fall of pressure with an area of negative pressure departure over the land areas adjoining the north Bay and adjoining land areas. Fairly widespread rain with isolated heavy falls occurred over Orissa and Arakan coasts. Chandbali and Sandoway each recorded 11 cm of rain, Bassein 14 cm and Tavoy 20 cm. By the evening of the same day, a low pressure area developed over the north Bay with associated upper air cyclonic circulation extending upto 500 mb. By the next morning, the low pressure area became more marked. There was more concentrated fall of pressure over Chittagong - Arakan coasts with more marked negative pressure departure area over there. Widespread rain with scattered heavy to very heavy falls occurred over Arakan coast. Sandoway recorded as many as 29 cm of rain. By the evening, the low pressure area over the north Bay became well marked. It concentra-

ted into a depression over the head Bay by the next morning and was centred at 0830 hrs IST of 26th near Lat. 21°N, Long. 89.5°E. The following observations on 26th are significant in this connection:

Name of the Ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
MV Andamans	0530	19.5	90.6	994.7	WSW	25	Overcast
Sandheads	0830			993.5	NE	5	
Chittagong	0830			997.1	SE	15	

With the formation of the depression, the northwesterly upper winds along Andhra coast strengthened considerably. In the course of the day, the depression moved in a westerly direction and lay in the evening with its centre at 1730 hrs IST near Lat. 21°N, Long. 88°E. Without any appreciable movement, it intensified into a deep depression by the mid-night and was centred at 0830 hrs IST of 7th near Lat. 21.0°N, Long. 88.0°E. The pressure deficiency at the centre of the deep depression was estimated to be about 10 mb. The following observations of 27th are significant in this connection:

Name of the Station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
Sandheads	0130			989.4	WSW	20	Rain
Sagar Island	0130			991.7	NNE	10	

By the evening, the deep depression crossed West Bengal - north Orissa coast near Balasore and was centred at 1730 hrs IST about 40 km southwest of Contai. Moving slowly northwestwards it lay over Gangetic West Bengal and adjoining Bihar Plateau in the morning of 28th with its centre at 0830 hrs IST about 50 km east of Jamshedpur. Maintaining its slow northwestwards movement and weakening at the same time, it lay as a depression centred at 1730 hrs IST about 120 km southeast of Hazaribagh. Moving further northnorthwestwards it weakened into a well marked low pressure area over Bihar Plains and adjoining Uttar Pradesh on the morning of 29th. By the evening, it weakened further into a low pressure area and was over east Uttar Pradesh where it became unimportant by the next morning.

The estimated lowest pressure and the corresponding departure from normal during the entire life period of the deep depression was 987 mb and -11 mb respectively at 0130 hrs IST of 27th July.

Under its influence, there was good monsoon activity near its track. Noteworthy amounts of rainfall were: Chandbali 11 cm on 24th, Chandbali 15 cm on 27th, Baripada 14 cm, Chandbali 11 cm and Balasore 10 cm on 28th, and Jamshedpur 19 cm on 29th.

### 5. Land depression—27 to 31 July—

On the evening of 26th July, a low formed over northeast Madhya Pradesh and adjoining northwest Madhya Pradesh and Uttar Pradesh. Associated circulation was noticeable upto 900 m a.s.l. and monsoon trough in the region was extending to 500 mb. By the morning of 27th, it concentrated into a depression with its centre at 0830 hrs IST near Sagar. Two closed isobars could be drawn. Though surface winds were weak, 15 - 25 knots strong winds were reported at 900 m a.s.l. Circulation extended to about 600 mb. Pressure departures near the centre were -5 to -7 mb. It remained practically stationary near Sagar till the morning of 28th. It moved westnorthwestwards and lay 80 km east of Guna by the morning of 29th. At this stage, winds at 900 m were 25 - 30 knots. By the evening it had moved northwestwards and had become deep and lay at 1730 hrs IST near Shivpuri. Gwalior close to the centre reported an easterly wind of 30 knots at 900 m. Three closed isobars could be drawn. The circulation extended to 500 mb.

It remained practically stationary till the next morning. By the evening of 30th, it had recurved northnortheastwards and lay close to Gwalior. Bhopal, in the southern sector reported westerly wind of 50 knots at 5,000'. By the next morning (31st), it remained practically stationary. The pressure departure from normal near the centre was -8 to -9 mb. By the evening it had weakened into a depression, and lay at 1730 hrs IST with centre 50 km south-southeast of Mainpuri. By the next morning (1st August), it had weakened into a low pressure area lying over west Uttar Pradesh.

### 6. Depression in the Bay of Bengal—23 to 24 August—

A trough of low pressure developed over the west central Bay of Bengal off Andhra coast on the morning of 20th August with cyclonic circulation in the upper air extending upto 4.0 km a.s.l. On the morning of 21st, the associated upper air cyclonic circulation extended upto 500 mb. It caused fairly widespread rain in the adjoining coastal areas. By the next morning, the trough shifted to the north and lay in the morning of 22nd over the west central Bay and the adjoining northwest Bay. The surface winds along Orissa - West Bengal coast backed from easterly to northeasterly and the weather belt also extended to the north. On the morning of 23rd, a concentrated fall of pressure was noticed over Orissa and West Bengal coasts and most of the stations in the coastal areas of Orissa and West Bengal were raining. It had shifted further to the northnortheast and lay in the morning of 23rd as a low over the northwest Bay and was well marked & concentrated into a depression by the evening of 23rd centred near Lat. 20.5°N, Long. 87.5°E. Moving slowly northwards, the depression lay in the morning of 24th close to the north Orissa coast centred at 0830 hrs IST about 30 km east of Balasore. In this connection the following observations of 24th are significant:

Name of the Station	Time of Obsn. IST	Pressure (mb)	W i n d		Weather Remarks
			Direction	Speed Knots	
Sandheads	0830	1000.2	SW	35	Continuous rain
Sagar Island	0830	999.8	SSE	10	Moderate rain
Balasore	0830	1000.0	N	2	Drizzle in last hour

The depression crossed north Orissa coast near Balasore during the forenoon, weakened and rapidly moving westnorthwestwards it lay as a well marked low in the same evening over northeast Madhya Pradesh. The low pressure area persisted till the morning of 25th over northeast Madhya Pradesh and neighbourhood. Continuing to move westnorthwestwards, the low pressure area lay in the morning of 26th over central parts of Uttar Pradesh and merged into the seasonal trough of low pressure in the evening. During these days, the rainfall associated with the disturbance was fairly widespread over the northern parts of the country and the north of the Peninsula. The estimated lowest pressure and the corresponding departure from normal during the entire period of the depression were 995 mb and  $-6$  mb. respectively at 2030 hrs IST of 24th.

Under its influence, the monsoon activity revived over the country with heavy rains over the belt extending from Orissa to Gujarat State and also over Uttar Pradesh.

#### 7. Deep depression in the Bay of Bengal—31 Aug to 3 Sept—

On the evening of 28th August, the nature of isobaric chart and fairly widespread thunderstorm activity over the central Burma and neighbourhood suggested that a low pressure system from the east was moving westwards across central Burma. On the morning of 29th most of the stations in lower Burma and the Bay Islands reported moderate to heavy rain. Tavoy reported a rainfall of 15 cm while Port Blair 14 cm. The above facts suggested that a low pressure area had formed on the morning of 29th over the east central Bay and adjoining north-east Bay. On the morning of 30th, stations along the Burma coast and the Bay Islands also reported rain and rise in pressure. The above facts together with the isobaric chart indicated that the low pressure area had moved slightly to the west and lay over northeast Bay and adjoining east central Bay. Associated trough extended to 500 mb. By the evening, the low pressure area was well marked. Moving slowly westnorthwestwards, it concentrated into a depression and lay at 0830 hrs IST of 31st near Lat.  $18.5^{\circ}\text{N}$ , Long.  $90.5^{\circ}\text{E}$ . Though no ships' data nearby are available, the nature of the well marked circulation upto 500 mb would suggest this. In the same evening, the pressure was falling rapidly over Orissa coast and neighbourhood and rising equally rapidly over Burma - East Pakistan coast. During the course of the day the depression moved westwards causing increased precipitation along the Orissa coast. It lay in the evening of 31st centred at 1730 hrs IST near Lat.  $19.2^{\circ}\text{N}$ , Long.  $88.0^{\circ}\text{E}$ . The following ships reports at 31 1730 hrs IST are relevant:

Name of the Ship	Position		W i n d		Pressure (mb)	Weather Remarks
	Lat. $^{\circ}\text{N}$	Long. $^{\circ}\text{E}$	Dir.	Speed Knots		
S.S.Mavh	18.8	89.8	S	15	1001.5	
S.S.Vwpp	15.4	85.5	W	20	1000.1	Heavy continuous rain

The depression continued to move westwards rapidly and lay close to coast in the morning of 1st with its centre at 0830 hrs IST near Lat.  $19.6^{\circ}\text{N}$ , Long.  $85.0^{\circ}\text{E}$  close to Gopalpur. The following observations of 1st are significant in this connection:

Name of the Ship	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
<u>Vishva</u>							
MV/Usha	0530	18.2	85.2	996.0	W	15	Continuous rain
S.S. Gopalpur	0830			997.7	E	5	Continuous Drizzle

Gopalpur recorded the lowest pressure in Orissa coast. During the forenoon, the depression crossed south Orissa coast near Gopalpur and lay in the evening of 1st over south Orissa centred at 1730 hrs IST about 50 km south-east of Titlagarh. Thereafter, the depression moved northwestwards and lay in the morning of 2nd over southeast Madhya Pradesh and adjoining Orissa with centre at 0830 hrs IST about 120 km southeast of Raipur and in the morning of 3rd over north Madhya Pradesh centred at 0830 hrs IST about 40 km southeast of Nowgong. Thereafter the depression weakened and lay in the morning of 5th as a diffuse low over Uttar Pradesh and by the 6th merged into the seasonal trough of low pressure. The estimated lowest pressure and the corresponding departure from normal during the entire period of the depression were 994 mb and -10 mb respectively on 31.8.65 and at 1730 hrs IST.

It caused good rain over the Bay Islands, Orissa, Madhya Pradesh, north-eastern parts of the Peninsula and over the central parts of north India.

#### 8. Depression in the Bay of Bengal— 19 to 24 September—

On the morning of 16th September, a low pressure system from the east was observed to be travelling westwards across Tennasserim. In association with it most of the stations over the Bay Islands and the Tennasserim reported rain. Pressures were falling over the whole country. An area of negative pressure departures appeared over Tennasserim and neighbourhood. Upper winds over Port Blair between 2.0 km a.s.l. and 4.0 km a.s.l. veered from west to northwest while those over the Deltaic Burma backed to southeasterly direction. On the next morning, there was pressure rise over the area east of the Tennasserim and the fall of pressure over the Bay Islands and Tennasserim continued and the concentrated area of negative pressure departures over the Tennasserim was more marked. Fairly widespread rain over the Bay Islands and Tennasserim also continued. These facts suggested that the low pressure system was moving into the north Andaman Sea. By the same evening, the pressure over Tennasserim was rising while that over the Bay Islands was still falling suggesting that the low pressure system had moved west into the north Andaman Sea. On the next morning, the pressure over the Bay Islands as well as over the Burma coast was rising indicating that the low pressure system had moved further to the west. The isobaric situation and the upper air charts of the morning of 18th indicated that a low pressure area had formed over the central Bay with cyclonic circulation in the upper air extending upto 4.0 km a.s.l. By the same evening, the low pressure area moved westwards and lay over the west central Bay. On the morning of 19th, no ships' observations were available from the central Bay but the morning upper wind observations of Andhra - Madras coast showed that a depression

had formed which lay centred at 0830 hrs IST near Lat.  $15.0^{\circ}\text{N}$ , Long.  $84^{\circ}\text{E}$  and the associated cyclonic circulation was extending to 500 mb. At 0830 hrs IST, at 900 m a.s.l., Vishakhapatnam reported easterly winds of 20 knots, Gannavaram northeasterly wind of 20 knots and Madras westnorthwesterly wind of 10 knots. Moving westnorthwestwards, the depression crossed south Andhra coast between Ongole and Masulipatnam during the night of 19th - 20th and lay on the morning of 20th over Andhra Pradesh with its centre at 0830 hrs IST near Rentachintala. Moving slowly northwestwards, the depression lay over north Andhra Pradesh on the morning of 21st with its centre at 0830 hrs IST about 70 km east of Hyderabad. The depression, thereafter recurved and moving northnortheastwards, lay on the morning of 22nd over southeast Madhya Pradesh with its centre at 0830 hrs IST about 100 km southwest of Kanker. It then moved northeastwards and lay on the morning of 23rd over northeast Madhya Pradesh with its centre at 0830 hrs IST 40 km southsoutheast of Ambikapur. Continuing to move northeastwards, it lay in the morning of 24th over Bihar Plateau and neighbourhood with the centre at 0830 hrs IST about 50 km north of Hazaribagh. Thereafter, it weakened into a low pressure area which lay in the morning of 25th over the eastern parts of Bihar and adjoining West Bengal. Persisting over the area for another day, it became unimportant by 27th. Under its influence, there was good rainfall activity in the northern parts of the Peninsula in Vidarbha, east Madhya Pradesh and northeast India. Heavy to very heavy rain occurred in Bihar State.

9. Deep depression in the Bay of Bengal—  
—7 to 8 October—

On the morning of 6th October, a low pressure area formed over the central Bay and adjoining north Bay with upper air cyclonic circulation extending upto 1.5 km a.s.l. and trough upto 4 km a.s.l. At 0530 hrs IST, S.S.Bharat Kesari (Lat.  $15.9^{\circ}\text{N}$ , Long.  $85.9^{\circ}\text{E}$ ) reported westerly 10 knots and shower and MV State of Travancore-Cochin (Lat.  $18.8^{\circ}\text{N}$ , Long.  $89.8^{\circ}\text{E}$ ) variable light wind and drizzle and at 0830 hrs IST Akyab reported southeasterly wind of 15 knots and drizzle. Scattered rain was reported by stations of the north Bay Islands, Coco Island and on Arakan coast. At 1130 hrs IST, S.S.Bharat Kesari (Lat.  $16.7^{\circ}\text{N}$ , Long.  $86.3^{\circ}\text{E}$ ) reported westerly wind of 15 knots while MV State of Travancore-Cochin (Lat.  $19.2^{\circ}\text{N}$ , Long.  $89.7^{\circ}\text{E}$ ) easterly wind of 20 knots confirming the existence of the low pressure area over the area. At 1730 hrs IST, S.S.Bharat Kesari (Lat.  $17.5^{\circ}\text{N}$ , Long.  $86.7^{\circ}\text{E}$ ) reported northwesterly wind of 10 knots, S.S.Bombala (Lat.  $19.2^{\circ}\text{N}$ , Long.  $90.1^{\circ}\text{E}$ ) northeasterly wind of 15 knots and continuous rain and S.S.Island (Lat.  $14.2^{\circ}\text{N}$ , Long.  $92.1^{\circ}\text{E}$ ) easterly wind of 15 knots with intermittent moderate rain and the upper air cyclonic circulation extending upto 3.0 km a.s.l. indicated that the low pressure area persisted over the area. On the morning of 7th, pressure commenced falling over the Bay Islands and along Burma coast with negative pressure departures over north Arakan coast. The rainfall over the north Bay Islands and Arakan coast continued. At 0530 hrs IST S.S.Bharat Kesari (Lat.  $19.2^{\circ}\text{N}$ , Long.  $87.5^{\circ}\text{E}$ ) reported northerly wind of 15 knots, S.S.Razdolnoge (Lat.  $16.8^{\circ}\text{N}$ , Long.  $91.8^{\circ}\text{E}$ ) southsouthwesterly wind of 10 knots and rain in the last hour. At 0830 hrs IST, Sandheads reported northeasterly wind of 5 knots and Akyab easterly wind of 10 knots and drizzle. These indicated that the low pressure area had shifted northeast and on the morning of 7th, it concentrated into a depression centred at 0830 hrs IST near Lat.  $18.5^{\circ}\text{N}$ , Long.  $91.0^{\circ}\text{E}$  over the north Bay and adjoining central Bay. Akyab reported eastsoutheasterly wind of 15 knots at 900 m at 0530 hrs IST of 7th. In the evening, there was a rise in barometric pressure over the Bay Islands but the pressure along Arakan coast and over deltaic Burma continued to fall. No ships' observations were available from the

northeast Bay and east central Bay, but the considerable strengthening of upper winds over Akyab in the evening indicated that the depression became deep by the evening of 7th and was centred near Lat.  $19.0^{\circ}\text{N}$ , Long.  $91.0^{\circ}\text{E}$ . At 1730 hrs IST, Akyab reported easterly wind of 25 knots at 300 m a.s.l. eastsoutheasterly wind of 25 knots at 600 m a.s.l., southeasterly wind of 30 knots at 900 m a.s.l. and 1.5 km a.s.l. and southeasterly wind of 35 knots at 2.1 km a.s.l. "Tiro VIII" photographs at 07 0520 hrs GMT show an apparent vortex near Lat.  $19^{\circ}\text{N}$ , Long.  $90^{\circ}\text{E}$  with central overcast area of about  $4^{\circ}$  in diameter and some indications of banding. Moving in a northnortheasterly direction, during the course of the night, it lay with its centre at 0830 hrs IST of 8th near Lat.  $20.5^{\circ}\text{N}$ , Long.  $91.5^{\circ}\text{E}$ . The only significant observations available were of Akyab which reported at 0830 hrs IST southerly surface wind of 25 knots and continuous rain, recording 14 cm of rain during preceding 24 hours. Continuing to move northnortheastwards during the day, the deep depression crossed Chittagong coast near Cox's Bazar by the same afternoon and rapidly weakened into a low pressure area which lay in the morning of 9th as a diffuse low over north Burma and moved away across northernmost part of Burma by the same evening.

The estimated lowest pressure and the corresponding pressure departure from normal during the entire life period of the depression were 999 mb and  $-10$  mb respectively on 8th at 1730 hrs IST.

In association with the disturbance, a few thundershowers occurred over the Bay Islands in the initial stage and over northeast India later. Maya Bandar recorded 3 cm of rain on 6th and Lumding 4 cm on 8th.

#### 10. Deep Depression in the Bay of Bengal— —20 to 25 October—

On the morning of 18th, fairly widespread rain was reported from stations along east coast with isolated heavy falls in Andhra coast. Kalingapatnam reported 16 cm of rain, Gopalpur 10 cm and Vishakhapatnam 6 cm. Many stations over the Bay Islands also reported rain. At 0530 hrs IST of 18th, S.S. Bharat Bhushan (Lat.  $12.1^{\circ}\text{N}$ , Long.  $84.2^{\circ}\text{E}$ ) reported southwesterly wind of 5 knots and drizzle in last hour, S.S. Mohammedi (Lat.  $13.3^{\circ}\text{N}$ , Long.  $83.5^{\circ}\text{E}$ ) reported northeasterly wind of 10 knots. A cyclonic circulation extending upto 2.0 km a.s.l. was noticeable in the upper winds over the southwest Bay off Madras coast. These indicated that the seasonal trough of low pressure was active over the southwest Bay where a low pressure area had formed and persisted there for the next 24 hours. By the morning of 20th, the low pressure area became well marked with associated upper air cyclonic circulation extending upto 3.0 km a.s.l. By the evening of 20th, it concentrated into a depression and lay with centre near Lat.  $12.5^{\circ}\text{N}$ , Long.  $83.0^{\circ}\text{E}$ . Ships' observations were inadequate; but the following upper winds at 900 m a.s.l. are relevant:

Madras	Northerly 20 knots
Vishakhapatnam	Eastnortheasterly 30 knots
Port Blair	Southeasterly 30 knots
Trincomalee	Westerly 15 knots

Upper wind observations of coastal stations indicated that the depression lay in the morning of 21st centred at 0830 hrs IST near Lat.  $13^{\circ}\text{N}$ , Long.  $83.5^{\circ}\text{E}$ . At 0530 hrs IST at 900 m a.s.l. Madras reported northerly winds of 20 knots, Vishakhapatnam northeasterly winds of 15 knots and Port Blair east-southeasterly winds of 35 knots. By the 22nd morning, it was probably centred near Lat.  $14^{\circ}\text{N}$ , Long.  $84.0^{\circ}\text{E}$ .



Moving in a northeasterly direction it lay at 1730 hrs IST of 22nd near Lat. 14.5°N, Long. 84.5°E. At 1130 hrs IST of 22nd, S.S.Mawana (Lat. 15.7°N, Long. 86.9°E) reported southerly winds of 20 knots and intermittent heavy rain. Continuing to move northeastwards and intensifying during the course of the night, the depression lay centred at 0830 hrs IST of 23rd as a deep depression near Lat. 15.5°N, Long. 85.0°E. At 0530 hrs IST, S.S.Mawana (Lat. 14.4°N, Long. 86.2°E) reported southsouthwesterly wind of 20 knots and intermittent rain and S.S.Eastern Ranger (Lat. 17.9°N, Long. 90.6°E) southerly wind of 15 knots and precipitation within sight. At 1130 hrs IST, MV Jalakirti (Lat. 17.3°N, Long. 86.6°E) reported northeasterly wind of 15 knots and continuous rain and S.S.Eastern Ranger (Lat. 19.1°N, Long. 89.8°E) eastsoutheasterly wind of 10 knots and shower and Caltex London (Lat. 16.5°N, Long. 83.2°E) northeasterly wind of 20 knots and overcast sky.

Moving northeastwards in the course of the day, the deep depression lay centred at 1730 hrs IST near Lat. 16.5°N, Long. 87.0°E. At 0830 hrs IST of 24th, Sandheads reported eastnortheasterly wind of 20 knots and Akyab southeasterly wind of 10 knots and intermittent drizzle recording 10 cm of rainfall, which show that the deep depression had continued to move northeastwards during night and lay in the morning of 24th near Lat. 18.0°N, Long. 89.5°E. Continuing to move northeastwards it lay on the evening of 24th over the northeast Bay centred at 1730 hrs IST near Lat. 18.5°N, Long. 90.5°E. The significant observations in this connection are given below:

Name of the Station	Date	Time of Obsn. IST	P r e s s u r e ( mb )	Wind		Weather Remarks
				Dir.	Speed Knots	
Sandheads	24.10.65	1730	1003.5	N	25	-
Akyab	24.10.65	1730	1002.6	SE	10	Intermittent drizzle

Tiros - X photographs at 24 0513 hrs GMT showed an apparent Vortex near Lat. 17°N, Long. 90°E, heavy overcast area of more than 5 degrees.

Akyab reported the lowest pressure over the Arakan coast with a fall of about 2 mb since morning (corrected for diurnal variation) and 5.6 mb since previous evening. Continuing its northeastward movement the deep depression crossed Arakan coast near Akyab in the early hours of 25th and by the same evening broke up over the Arakan hills.

The estimated lowest pressure and the corresponding departure from normal during the entire life period of the deep depression was 997 mb and -12 mb on 24th at 1730 hrs IST.

Under its influence, there was good rainfall activity over the east coast in the early stage of its formation and over northeast India and the Bay Islands later. Some of the noteworthy amounts of rainfall recorded are: Gopalpur 10 cm, Kalingapatnam 16 cm on 18th, Puri 11 cm and Balasore and Chandbali 7 cm each on 20th, Balasore 20 cm, Sagar Island 9 cm, Contai 8 cm, Chaibasa, Jamshedpur and Baripada 7 cm each on 21st and Maya Bandar 12 cm on 24th.

# 11. Cyclonic storm of small extent in the Bay of Bengal—4 to 9 Nov.—

On the morning of 3rd, a fall of pressure was noticed at stations to the east of Tennasserim coast while there was pressure rise along Tennasserim coast which showed that a low pressure system was moving from the east. Under its influence, a low formed over south Andaman Sea by the evening with cyclonic circulation extending to 900 m a.s.l. Victoria Point reported northeasterly wind of 20 knots at 300 metres a.s.l. On the morning of 4th all the stations in the Bay Islands reported Rain. Car Nicobar reported 13 cm of rain. Tiros photographs at about 0400 GMT showed a heavy overcast area of 3 degrees in diameter around Lat. 8°N, Long. 91°E. At 1130 hrs IST, a ship with call sign FNGA near Lat. 14°N, Long. 93.7°E reported eastsoutheasterly wind of 20 knots and another without call sign at Lat. 6.1°N, Long. 91.3°E reported westnorthwesterly wind of 15 knots with overcast skies and shower in the past. A depression formed at 1130 hrs IST on 4th with centre near Lat. 8.5°N, Long. 93.0°E. There were no ships' data till 8th. The only source of information was the satellite cloud pictures and the track is based on Tiros fixes. At 0553 hrs GMT of 5th, Tiros - VIII showed a disturbed area centre about Lat. 10.5°N, Long. 88.5°E and bandings well defined. So the depression had moved westnorthwestwards and was of the same intensity centred at 0830 hrs IST near Lat. 10.5°N, Long. 88.5°E. Tiros - X pictures at 06 0500 hrs GMT of 6th showed it as a vortex near Lat. 12.5°N, Long. 85.5°E with diameter 3.5 degrees with eye dimly visible. Pronounced outflow in the north quadrant. So by 0000 hrs GMT of 6th, the depression had moved westnorthwestwards and intensified into a cyclonic storm. On 7th also the ships' data were inadequate. The storm was apparently centred at 0830 hrs IST of 7th near Lat. 13.0°N, Long. 82.5°E. It was probably lying at 1730 hrs IST of 7th near Lat. 12.5°N, Long. 82.0°E, and it would appear that the storm was moving in a southwesterly direction. At 1430 hrs IST of 7th, a ship of call sign Gkje near Lat. 13.5°N, Long. 80.7°E reported northeasterly wind of 25 knots. At 12 hrs GMT of 7th Madras reported northerly wind of 25 kt at 600 m. At 0000 GMT of 8th Madras reported northnortheasterly wind of 25 knots at 900 m. It was centred at 0830 hrs IST of 8th near Lat. 12.0°N, Long. 81.0°E Tiros - VIII pictures at 0503 hrs GMT of 8th showed it as a disturbed area centred about Lat. 12°N, Long. 81°E with bandings well defined and eye visible. At 1230 hrs IST of 8th, Madras harbour reported mean northnortheasterly wind of 25 knots. The direction was northwesterly upto 0800 hrs IST becoming northeasterly by 1230 hrs IST. Swell was becoming more than moderate and wind speed in squalls was 30—36 knots. At 1130 hrs IST of 8th, Madras reported northeasterly wind of 30 knots at 3,000 ft. At 1730 hrs IST of 8th, a ship<sup>481</sup> call sign Vwpv at Lat. 11.9°N, Long. 80.8°E reported southsoutheasterly wind of 25 knots with pressure of 1005.4 mb and overcast skies. At this time the storm was probably centred near Lat. 11.5°N, Long. 80.5°E. The ship S.S.Vwpv at 2330 hrs IST of 8th at Lat. 12.5°N, Long. 82.1°E reported eastnortheasterly wind of 25 knots. The storm was centred at 0830 hrs IST of 9th near Lat. 11.0°N, Long. 80.5°E and was probably weakening into a deep depression. Tiros pictures at 0535 hrs GMT of 9th showed it as a disturbed area near Lat. 11°N, Long. 80°E with some bandings. Nagapattinam port experienced maximum wind of 48 knots at 1545 hrs IST of 9th. The storm rapidly weakened into a deep depression and lay at 1730 hrs IST of 9th near 10.5°N, Long. 80.0°E. It moved further south, rapidly weakened into a well marked low and lay over the Gulf of Mannar on the morning of 10th. It become unimportant by 13th.

During the course of its usual southward movement, there was strong northwesterly to northerly flow over Peninsula in the middle troposphere.

Under its influence, there was good rainfall activity in the Bay Islands and in south Peninsula. Car Nicobar recorded 13 cm of rain on 4th, 8 cm on 5th, Pamban 12 cm, Cuddalore 10 cm and Alleppey 8 cm on 10th.

12. Severe cyclonic storm in the Bay of Bengal—6 to 15 December—

On the morning of 5th all stations over the south Bay Islands and Victoria Point reported rain. At 0530 hrs IST, two ships, one at Lat. 6°N, Long. 91.5°E reported westsouthwesterly wind of 20 knots and continuous heavy rain and the second at Lat. 5.8°N, Long. 93.8°E southeasterly wind of 10 knots and precipitation within sight and at 0830 hrs IST Car Nicobar reported easterly light wind and overcast sky. These indicated that a low pressure area lay in the morning of 5th over the south Andaman Sea. On the same evening, pressure was falling over the Bay Islands and at 1730 hrs IST, the ship of call sign Gxgs (Lat. 6.6°N, Long. 91.6°E) reported northeasterly wind suggesting that the low pressure area lay over the same area without intensification. Next morning, pressure continued to fall over the Bay Islands where all stations reported rain. The low pressure area persisted over the same area till 6th morning after which it moved slightly to the west. Tiros photographs at 0528 hrs GMT of 6th reported disturbed area near Lat. 7°N, Long. 91°E with overcast cloud to the northwest. At 1730 hrs IST of 6th, a ship of call sign Gmsn (Lat. 10.3°N, Long. 87.3°E) reported eastnortheasterly wind of 20 knots. The low pressure area concentrated into a depression and lay with its centre near Lat. 6°N, Long. 90.5°E at 1730 hrs IST of 6th. On the morning of 7th, the depression moved northwestwards and lay over the southeast Bay with centre at 0830 hrs IST of 7th near Lat. 7.5°N, Long. 89.5°E. All the stations over the Bay Islands reported rain in the morning of 7th, Car Nicobar reporting 9 cm of rain and Nan Cowrie 8 cm. The only significant observation available in this connection was from the ship of Call Sign Gmsn which reported eastnortheasterly wind of 20 knots and continuous moderate drizzle. Tiros - X photographs at 1028 hrs IST of 7th showed a vortex near Lat. 8°N, Long. 89°E with a central overcast area two degrees in diameter, cirrus outflow and spiral banding. At this time it was probably deep. The depression moved northnorthwest and lay in the evening with its centre at 1730 hrs IST near Lat. 9.0°N, Long. 89°E. Significant observations in this connection of 7th are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
Vwps	1730	12.1	90.1	1007.1	ESE	25	Overcast sky Squall
No Call sign or name	1730	6.0	87.1	1006.1	W	20	Precipitation within sight
Mvso Kutch	1730	9.1	92.6	1006.6	SE	20	Overcast sky
Port Blair	1730			1007.6	ESE SE	15 35	Overcast sky at 3000 ft.

Moving in a northerly direction during the night, it intensified into a cyclonic storm which lay in the morning of 8th with centre at 0830 hrs IST near Lat. 11°N, Long. 89°E. In this connection, the significant observations of 8th are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Saudi	0530	11.0	88.5	998.6	NE	27	Overcast sky (shower) Squall
S.S.Saudi	0800	10.7	88.0	1003.3	NW	37	Continuous heavy rain
Mvso Kutch	0530	8.9	89.5	1004.7	SSW	22	Shower in last hours
S.S.Frienfels (Dedp)	0530	13.0	86.7	1004.1	NNE	15	Shower
S.S.Devon City (Gfda)	0530	14.4	87.2	1006.0	NE	20	Shower

The plain language message reported by S.S.Saudi at 0800 hrs IST follows:

"Lat. 10.44°N, Long. 88.02°E, speed 11.0 knots course 235 degrees wind northwest force 8—9 B.F. Heavy rain. Barometer 1003.3 rising."

At 1100 hrs IST S.S.Grosevenor Trader (Ghcs) (Lat. 13.2°N, Long. 87.3°E) reported "northeasterly to northerly wind force 8 B.F. High sea, heavy east-north-east swell, rain squall." At 1130 hrs IST S.S.Saudi reported northwesterly wind of 30 knots and heavy rain, S.S.Bhamo (Gwsf) (Lat. 13.5°N, Long. 91.2°E) easterly wind of 25 knots intermittent moderate rain and Port Blair southwesterly wind of 15 knots and continuous rain.

At 1430 hrs IST S.S.Freinfels (Lat. 14.2°N, Long. 87.7°E) reported north-northeasterly wind of 35 knots and intermittent rain. Continuing its northward movement during the course of the day without further intensification, the cyclonic storm lay centred at 1730 hrs IST of 8th near Lat. 12°N, Long. 89°E. Some noteworthy observations of 8th in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Frienfels	1730	14.0	87.5	1003.5	NE	40	Shower in last hour
S.S.Devon City	1730	12.3	88.4	997.3	NE	25	Violent rain shower
Mvso Kutch	1730	9.6	88.1	1005.8	W	20	Overcast sky
S.S.Saudi	1730	10.0	87.0	1005.3	NW	20	Overcast sky
Port Blair	1730			1008.8	SW	15	Continuous rain

At 0530 hrs IST of 9th the ship Freinfels whose position was Lat. 14.9°N, Long. 88.1°E, about 250 km away from the centre of the storm, reported wind of 37 kt; it is inferred that the winds near the centre of the storm might have

- reached 50 knots. Thus in the course of the night, the cyclonic storm probably intensified further into a severe cyclonic storm and continuing in its northward movement it lay in the morning of 9th centred at 0830 hrs IST near Lat. 13°N, Long. 89°E. The significant observations of 9th in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Bhamo	0530	11.7	88.4	1000.5	W	33	Continuous moderate rain
S.S.Freinfels	0530	14.9	88.1	1002.0	ENE	37	Drizzle
S.S.Freinfels	0830	15.2	88.3	1004.5	ENE	37	Drizzle in last hour
S.S.Grosvenor	0730	11.6	89.0	1003.7	W	30	Continuous rain
S.S.Clan MacLay	0530	14.2	86.7	1009.2	NE	20	Overcast sky
Port Blair	0830			1009.7	S	15	Continuous rain

At 1130 hrs IST S.S.Bhamo (Lat. 11.9°N, Long. 88.1°E) reported westerly wind of 33 knots. At 1330 hrs IST, S.S.Grosvenor (Lat. 11°N, Long. 90°E) reported westsouthwesterly wind of 37 knots and at 1430 hrs IST Freinfels (Lat. 16.0°N, Long. 88.7°E) reported northeasterly wind of 37 knots and at 1430 hrs IST Freinfels (Lat. 16.0°N, Long. 88.7°E) reported northeasterly wind of 37 knots. The severe cyclonic storm remained practically stationary till the evening of 9th. Thereafter, owing to the absence of ships' observations from the storm field till the morning of 12th, the position of the severe cyclonic storm cannot be fixed with certainty. It was probably centred at 0830 hrs IST of 10th near Lat. 13.5°N, and Long. 89.0°E.

However, Tiros - X photographs at 11 0439 hrs GMT showed tropical cyclone near Lat. 12.5°N, Long. 89°E near edge of picture with bands to northwest and east. (Unable to see western half). The severe cyclonic storm was apparently stationary near Lat. 13.5°N, Long. 89.0°E till the evening of 11th. Thereafter it shifted westwards.

At 00 hrs GMT of 12th, a ship (call sign unknown) near Lat. 13.9°N, Long. 85.5°E reported a wind of northerly 40 knots and pressure 999.4 mb. The storm was centred at 0830 hrs IST near Lat. 13.5°N, Long. 87.5°E. Tiros - X photographs at 0547 hrs GMT of data showed tropical vortex with well defined eye and banding in all quadrants, near Lat. 12°N, Long. 87°E with central overcast 5 deg. in diameter.

Ships observations available in the mid-day of 12th indicated that the severe cyclonic storm lay over the west central Bay centred at 1330 hrs IST with its centre near Lat. 14.0°N, Long. 87.0°E. The significant ships' observations of 12th in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Harrington Trader	1000	12.8	84.8	1005.2	NNE	45-50	Squall
S.S.Indian Trust	1030	16.4	83.7	1007.1	NE	30	Overcast sky
S.S.Janussha	1300	12.1	84.3		NW	28	
S.S.Fresland	1130	17.2	87.2	1006.5	ENE	25	Overcast sky

The following observations of 12th are also relevant:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Harrington Trader	1730	16.0	85.0	1000.4	NE	50-55	Sea very high reaching to 60 in rain squalls
S.S.Banda	1730	15.1	88.4	1002.8	ESE	30	Intermittent rain
MV Jala Mudra	1730	14.0	82.7	1003.8	N	20	Overcast sky
Gnne	1530	13.0	86.2		N	35	Overcast sky

Moving northwestwards during the course of the night, the disturbance lay centred at 0830 hrs IST of 13th near Lat. 14.5°N, Long. 86.5°E. Following observations of 13th are worth mentioning in this connection:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Shunwind (Vqjj)	0530	13.9	85.5	999.4	N	40	Squall
S.S.Janussha	0530	14.0	85.0	999.6	NW	30	Continuous heavy rain
MV Andaman	0530	15.4	88.0	1003.6	SE	30	
S.S.Indian Trust	0530	16.4	84.1	1001.0	NW	30	Squall

At 1130 hrs IST of 13th, S.S.Indian Trust (Lat. 16.7°N, Long. 84.0°E) reported northnortheasterly wind of 35 knots, MVS O Kutch (Lat. 17.1°N, Long. 64.4°E) northnortheasterly wind of 30 knots and S.S.Jag Jamna (Lat. 18.2°N, Long. 85.4°E) northnortheasterly wind of 30 knots. Tiros - X photographs at 0520 hrs GMT of 13th showed "A vortex with eye visible near Lat. 14°N, Long. 86°E

with a central overcast area five degrees in diameter with cirrus outflow and spiral bandings." At this stage the storm probably had a core of hurricane winds. Moving slowly northwards, it lay on the evening of 13th with its centre at 1730 hrs IST near Lat. 15.0°N, Long. 86.5°E. The significant observations on 13th follow:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.India Trust	1730	16.6	83.7	1001.0	N	35	Overcast sky
MV Visva Prem	1730	16.2	84.8	998.4	NE	25	Intermittent rain
MV Andaman	1730	14.6	90.0	1001.9	SSE	37	
S.S.Janusha	1930	14.1	83.1	1008.5	NW	24	

Barometric pressure which had commenced falling over Arakan coast in the morning continued to fall in the evening. At 1730 hrs IST Akyab recorded a rainfall of 12 cm since 0830 hrs IST. These indicated that the disturbance was showing tendency to recurve to northeast. At 13 2330 hrs IST, a ship GWKS at Lat. 16.2°N, Long. 86.8°E reported northerly 50 knots wind and pressure 984.2 mb. At this time the centre was near Lat. 16°N, Long. 87°E. Moving rapidly northeastwards, it lay in the morning of 14th over the north Bay centred at 0830 hrs IST near Lat. 18.5°N, Long. 88.5°E. The following observations of 14th are significant in this connection:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Forthfield	0530	19.2	89.3	1000.1	NE	30	Shower
	0830	19.3	89.3	1002.0	ENE	30	Shower
S.S.Mahont	0530	18.6	88.5	998.7	NE	25	-
	0730	18.4	88.0	996.9	N	52	Sea very rough gusting to 60
Gwya	0530	18.0	87.0	998.9	N	68	High sea very heavy swell
Vwyg	0530	18.0	87.8		NNE	70	

At 0830 hrs IST of 14th, Akyab recorded 21 cm of rain during the past 24 hours. At 1130 hrs IST S.S.Forthfield (Lat. 19.3°N, Long. 88.3°E) reported northerly wind of 71 knots and S.S.Mahont (Lat. 19.2°N, Long. 88.1°E) northerly wind of 60 knots. Tiros - X at 1022 hrs IST of 14th showed a vortex centred near Lat. 18.5°N, Long. 89°E with eye visible and long wide band extending northeastwards from the storm. Broken to overcast Cb extending to eastern position of West Bengal, Assam and Burma including lower Burma with a patch of scattered Cb along Burma coast and Andaman Sea and broken Cu and Ci in east central Bay.

Continuing its northeastwards movement during the day, it lay in the evening centred at 1730 hrs IST near Lat. 19.5°N, Long. 90°E. Noteworthy observations of 14th in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
S.S.Mahont	1730	18.4	87.5	1002.8	NNW	37	Overcast sky
Akyab	1730			1004.2	SE	20	Drizzle

At 2330 hrs IST <sup>Akyab</sup> recorded a southeasterly wind speed of 45 knots and continuous rain. Continuing its northeast movement the severe cyclonic storm with a core of hurricane winds crossed Chittagong coast by the early hours of 15th, rapidly weakened and broke up against Chittagong - Burma hills the next day.

Under its influence the Bay Islands received good rainfall with a few heavy to very heavy falls almost during the entire life period of the storm. A few showers also occurred in Assam towards the end period. The chief amounts of rainfall recorded are: Maya Bandar 14 cm on 9th and 9 cm on 10th, Port Blair 13 cm, Long Island 9 cm on 10th and Car Nicobar 10 cm on 11th.

### 13. Cyclonic storm in the Arabian Sea— 5 to 12 December—

By the evening of 4th December, the seasonal trough over southeast Arabian Sea was extending to 500 mb. On the morning of 5th, a low pressure area lay over the southeast Arabian Sea and by the evening it concentrated into a depression with centre at 1730 hrs IST near Lat. 6.5°N, Long. 71.5°E. The relevant ships' observations in this connection are:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind	
		Lat. °N	Long. °E		Direction	Speed Knots
Pgpk	1730	7.6	70.3	1003.8	N	15
Gpgc	1730	7.5	74.7	1004.9	SE	15

On the 6th morning, Minicoy reported pressure departure from normal of about -6 mb. The depression moved northwards and was centred near Lat. 7.5°N, Long. 71.5°E at 0830 hrs IST. Minicoy at 1730 hrs IST reported south-southwesterly of 25 knots right from 1000 ft. to 500 mb showing that the depression was vertical without much slope. It was then centred near Lat. 9°N, Long. 71.5°E. By the next morning (7th) it had shifted northeastwards and lay centred near Lat. 9.5°N, Long. 72.0°E as a deep depression. The following observations are relevant:



Name of the ship/station	Time of Obsn. IST	Position		P r e s s u r e ( mb )	Wind	
		Lat. °N	Long °E		Direction	Speed Knots
Minicoy	0830			1003.0	SW	10
Amini Divi	0830			1004.5	SSE	15
Gmrs	0530	8.6	70.1	1002.2	NW	15

By the evening of 7th, the deep depression had further intensified into a cyclonic storm and was centred near Lat. 10.0°N, Long. 72.5°E. The following observations are relevant:

Name of the ship/station	Time of Obsn. IST	Position		P r e s s u r e ( mb )	Wind	
		Lat. °N	Long °E		Direction	Speed Knots
Minicoy	1730			1001.5	W	20
Amini Divi	1730			999.4	E	15
Argull	1730	9.7	74.3	Mutilated	SE	30

A ship Gvbx located at Lat. 9.6°N, Long. 72.7°E reported at 2330 hrs IST of 7th, a surface wind of 270°/30 knots with a low pressure of 997.3 mb. By the next morning (8th), the cyclonic storm moved slightly eastnortheastwards and lay at 0830 hrs IST centred near Lat. 10°N, Long. 73.0°E. The upper winds along Kerala coast had considerably strengthened.

S t a t i o n	Time	Feet	W i n d	
			D i r e c t i o n	Knots
Cochin	0530	3000	Southsoutheasterly	40
Mangalore	0530	3000	Southeasterly	30
Trivandrum	0530	3000	Southsouthwesterly	25

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	W i n d	
		Lat. °N	Long. °E		Direction	Speed Knots
Amini Divi	0830			999.5	E	10
Minicoy	0830			1004.5	W	25
Wdib	1130	11.5	74.6	1005.4	ESE	35
					(far from Centre)	
Gmwg	0530	8.7	69.6	1008.6	NW	15

At 1130 hrs IST Minicoy reported westerly wind of 40 knots at 1000 ft. a.s.l. and 45 knots at 2000 ft a.s.l. (last level). By the evening, it was probably centred near Lat. 11°N, Long. 74°E. At 3000 ft. a.s.l. Minicoy reported westerly wind of 40 knots, Trivandrum southwesterly wind of 30 knots and Mangalore southeasterly wind of 15 knots.

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
Piek	1730	9.2	72.3	1004.6	WNW	15	Heavy continuous rain
Fnez	1730	7.7	72.5	1005.3	W	35	Moderate continuous rain
Pdiu	1730	8.8	75.8	1003.4	SW	25	Overcast
Kozhikode	1730			1005.4	E	5	Overcast

By the next morning (9th), the storm had moved northnortheastwards and lay at 0830 hrs IST with centre near Lat. 12°N, Long. 74.5°E. The relevant observations are:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long. °E		Dir.	Speed Knots	
Mangalore	0830			997.4	E	25	Heavy continuous rain
Ship (No call sign)	0530	10.8	73.8	1005.5	WSW	5	Overcast

Tiros - VIII pictures at 0825 hrs GMT covered only the western portions of the storm and reported western edge of overcast cloud mass east of 69°E. The storm then moved northnorthwestwards along the west coast to Lat. 13.5°N, Long. 74°E by the evening. A Ship Vskv near Lat. 13.6°N, Long. 74°E reported a wind of 270°/30 knots. Continuing to move northnorthwest along west coast, it was centred at 0830 hrs IST of 10th, near Lat. 15°N, Long. 73.5°E. Vengurla reported a pressure of 999.9 mb and surface wind eastnortheasterly of 15 knots.

Tiros picture at 10 0730 hrs GMT reported vortex centered near Lat. 15°N, Long. 74°E. Moving northnorthwest it lay centred at 1730 hrs IST of 10th close to Devgad. By the next morning it lay near Lat. 17°N, Long. 72.5°E. Poona reported at 0530 hrs IST eastsoutheasterly wind of 30 knots at 5000 ft. By the evening it had weakened into a depression and was centred near Lat. 17.5°N and Long. 72.5°E. Tiros - VIII pictures at 11 0600 hrs indicated only broken to overcast clouds along the west coast from Kerala to Kathiawar. It was centred on the morning of 12th near Lat. 18.0°N and Long. 72.5°E. By the evening, it weakened into a low pressure area, moved inland and lay over south Madhya Maharashtra.

Under the influence of this disturbance, heavy rain and squally winds were experienced along the west coast upto Lat. 17°N. The Chief amounts of rainfall reported are: Minicoy 9 cm on 6th and 15 cm on 7th, Cochin 9 cm, Androth 15 cm, Minicoy 22 cm on 8th, Androth 21 cm, Cochin 12 cm on 9th, Mangalore 15 cm, Honavar 10 cm on 10th, Panjim 11 cm, Devgad 9 cm, Honavar 9 cm, Miraj 7 cm on 11th and Karwar 7 cm on 12th.

According to press reports, a number of country crafts and fishing vessels were sunk and some lives lost off the west coast due to the cyclonic storm. Telegraph and telephone communications broke down and many coconut trees were uprooted in the Konkan. Extensive damage to sailing vessels was reported from Mysore and Konkan coasts.

14. Severe cyclonic storm in the Bay of Bengal—  
29 December 1965 to 3 January 1966—

A low pressure system from the east was observed to be moving towards the extreme south Andaman Sea across Tennasserim on 28th. On the morning of 29th, a rise of barometric pressure was observed over the Tennasserim coast and a fall over the south Bay Islands and the adjoining north Bay Islands and thunder-rain occurred over the south Bay Islands. These indicated that the low pressure system had moved westwards into the extreme south Andaman Sea. In the same evening, a rise<sup>in</sup> pressure was observed over stations in the south Bay Islands. At 1730 hrs IST of 29th, S.S.Rajula (Lat. 9.1°N, Long. 84.9°E) reported a northerly wind of 20 knots and overcast sky and ship of call sign Gcxu (Lat. 5.8°N, Long. 86.4°E) a northerly wind of 20 knots and precipitation within sight. These indicated that it had moved further to the west and concentrated into a depression on the evening of 29th with its centre near Lat. 7.5°N, Long. 88°E. By the next morning, the depression intensified into a deep depression over the southwest Bay and adjoining southeast Bay of Bengal whose centre at 0830 hrs IST of 30th was near Lat. 8°N, Long. 87.5°E. The significant ships' observations of 30th in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Rajula	0530	8.4	87.1	1004.9	N	30	Intermittent rain
Phtm	0530	6.0	87.8	1005.8	SW	10	-
Gcku	0530	5.8	89.2	1007.4	WSW	10	Precipitation within sight
Gmsn	1130	8.2	87.9	1006.6	S	10	-

At 1130 hrs IST, S.S.Sengakalis (Lat. 6.0°N, Long. 84.0°E) reported northwesterly wind of 20 knots and precipitation within sight. Tiros - X photographs at 1040 hrs IST of 30th reported "Broken to overcast Ch, heavy repeat heavy over area from northeast Ceylon to Andaman Islands about 4 to 5 degrees in width". Moving northwestwards during the course of the day, the depression was centred at 1730 hrs IST near Lat. 8.5°N, Long. 87.0°E. The significant observations of 30th in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Rajula	1730	7.8	88.7	1006.5	S	20	Precipitation within sight
S.S.Freinfels	1730	13.2	85.3	1009.5	NE	25	Overcast sky
S.S.Caltex Ulnecht (Pdiv)	1730	11.2	82.3	1011.1	NNE	20	Overcast sky

On the morning of 31st, the upper winds over Ceylon and over south Madras coast backed from northnortheasterly/northeasterly direction to north or northnortheasterly direction and markedly strengthened. Moving westnorthwestwards in course of the night, the deep depression rapidly intensified into a cyclonic storm which lay on the morning of 31st over the southwest Bay of Bengal centred at 0830 hrs IST near Lat. 9.0°N, Long. 86.0°E.

That the disturbance had reached the state of cyclonic storm is further evidenced by the 1130 hrs IST observations of S.S.Freinfels (Lat. 9.8°N, Long. 83.7°E) which reported northerly winds of 45 knots and continuous heavy rain and of S.S.Pegu (Lat. 11.1°N, Long. 85.4°E) reporting in plain language wind northeast to east force 7, Bar. 1006.3 falling rapidly frequent rainsqualls approaching cyclone. Moving slowly westnorthwestwards during the course of the day, the cyclonic storm was centred at 1730 hrs IST near Lat. 9.5°N, Long. 84.0°E. The following observations of 31st are of significance:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
S.S.Pegu	1730	11.9	84.4	1007.1	E	20	Intermittent heavy rain
S.S.Freinfels	1730	8.6	83.2	1003.0	WNW	40	Overcast sky

During the night, the cyclonic storm moved westnorthwestwards without further intensification and lay in the morning of 1st January 1966 centred at 0830 hrs IST near Lat. 10°N, Long. 82.0°E. At 0530 hrs IST of 1st, M.V.S/o Rajasthan (Lat. 8.7°N, Long. 81.5°E) reported westerly wind of 30 knots, ship of call sign Ghbr (Lat. 9°N, Long. 85.7°E) southerly wind of 15 knots and at 0830 hrs IST M.V.S/o Rajasthan (Lat. 9.3°N, Long. 81.5°E) westerly winds of 30 knots and Trincomalee westsouthwesterly wind of 10 knots. At 1130 hrs IST, upper winds of Madras strengthened considerably. It reported northerly 25 knots at 300 m a.s.l. northnortheasterly 35 knots at 600 m a.s.l., northnortheasterly 30 knots at 900 m and 1.5 km a.s.l. At 1430 hrs IST M.V.S/o Rajasthan (Lat. 10.3°N, Long. 80.9°E) reported westerly wind of 35 knots and shower. Moving northwestwards during the course of the day, the cyclonic storm was centred at 1730 hrs IST near Lat. 11°N, Long. 81.5°E. The following observations of 1st January 1966 are significant:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
M.V.S/o Rajasthan	1730	10.6	80.9	1003.1	NW	35	Overcast sky
Cuddalore	1730			1008.9	NNE	5	-

M.V.S/o Rajasthan reported at 1930 hrs IST (Lat. 10.9°N, Long. 80.8°E) northwesterly wind of 35 knots and at 2130 hrs IST (Lat. 11.4°N, Long. 80.7°E) northerly wind of 35 knots. Moving in a northerly direction during the course of the night, the cyclonic storm lay in the morning of 2nd with its centre at 0830 hrs IST near Lat. 13.0°N and Long. 81.5°E. The significant observations of 2nd in this connection are given below:

Name of the ship/station	Time of Obsn. IST	Position		Pressure (mb)	Wind		Weather Remarks
		Lat. °N	Long °E		Dir.	Speed Knots	
Gtnq	0530	12.2	83.7	1008.3	SSE	30	Shower
"	0730	11.7	83.6	1009.8	S	30	Shower
M.V.S/o Rajasthan	0530	12.9	80.5	1005.2	NNW	20	-
"	0930	12.3	83.6	1011.6	S	35	-

From the wind speed of 35 knots reported at 1130 hrs IST by the ship of call sign Gtnq (Lat. 13.0°N, Long. 84.3°E), which was about 150 km away from the centre of the storm, it is concluded that the winds near the centre of the storm may have reached 48 knots, and the cyclonic storm had reached the stage of severe cyclonic storm which continuing northerly course was centred at 1730 hrs IST near Lat. 14.5°N, Long. 81.5°E. Tiros - X photographs at 1058 hrs IST of 2nd also showed "Strong cyclone centred approximately 14°N, Long. 83°E. Heavy overcast about 6 degrees in diameter with pronounced banding and outflow."

Moving northnortheastwards during the night, the severe cyclonic storm crossed Andhra coast close to Vishakhapatnam in the early hours of 3rd, weakened and lay as a cyclonic storm in the morning of 3rd over northeast Andhra Pradesh with its centre at 0830 hrs IST of 3rd about 20 km northwest of Vishakhapatnam.

During the course of the day, the cyclonic storm weakened into a deep depression, moved northeast and lay in the same evening over Orissa with its centre at 1730 hrs IST near Lat. 19.5°N, Long. 84.5°E, about 70 km northwest of Gopalpur. In course of the night the deep depression weakened further, rather rapidly, into a well marked low pressure area which continuing its northeastwards movement, lay in the morning of 4th over Gangetic West Bengal. Thereafter, the well marked low pressure area weakened further and moved away northeastwards across Assam by 5th.

The estimated lowest pressure and the corresponding departure from normal during the entire life period of the severe cyclonic storm was 994 mb and -20 mb on 2/1/66 at 1730 hrs IST respectively.

Under its influence, a spell of heavy rain occurred over the south Bay Islands in the initial stage of its formation. Heavy rain and gales also occurred in north coastal Andhra Pradesh, Northeast India, east Madhya Pradesh, east Uttar Pradesh also received widespread rain with a few heavy falls in coastal Orissa. Some of the noteworthy amounts of rainfall are: Car Nicobar 8 cm on 31st December, Vishakhapatnam 8 cm and Kalingapatnam 7 cm on 3rd January, Puri and Gopalpur 7 cm each on 4th. Vishakhapatnam also recorded a maximum wind speed of 128 km per hour when the storm was crossing the coast in the morning of 3rd January.

Table II

Monthly distribution of cyclonic storms and depressions in the Bay of Bengal and Arabian Sea - 1965

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Disturbance	D C	D C	D C	D C	D C	D C	D C	D C	D C	D C	D C	D C	D C
Bay of Bengal					2(2)		2	2	1	2	1	2(2)	7 5/4
Arabian Sea												1	1
Land Depression						1							1
Total					2(2)		3	2	1	2	1	2(2)	8 6/4

D - Depression

C - Cyclonic storm

Figures in brackets indicate cyclonic storm

# TRACKS OF STORMS AND DEPRESSIONS (IN THE INDIAN SEAS)

1965

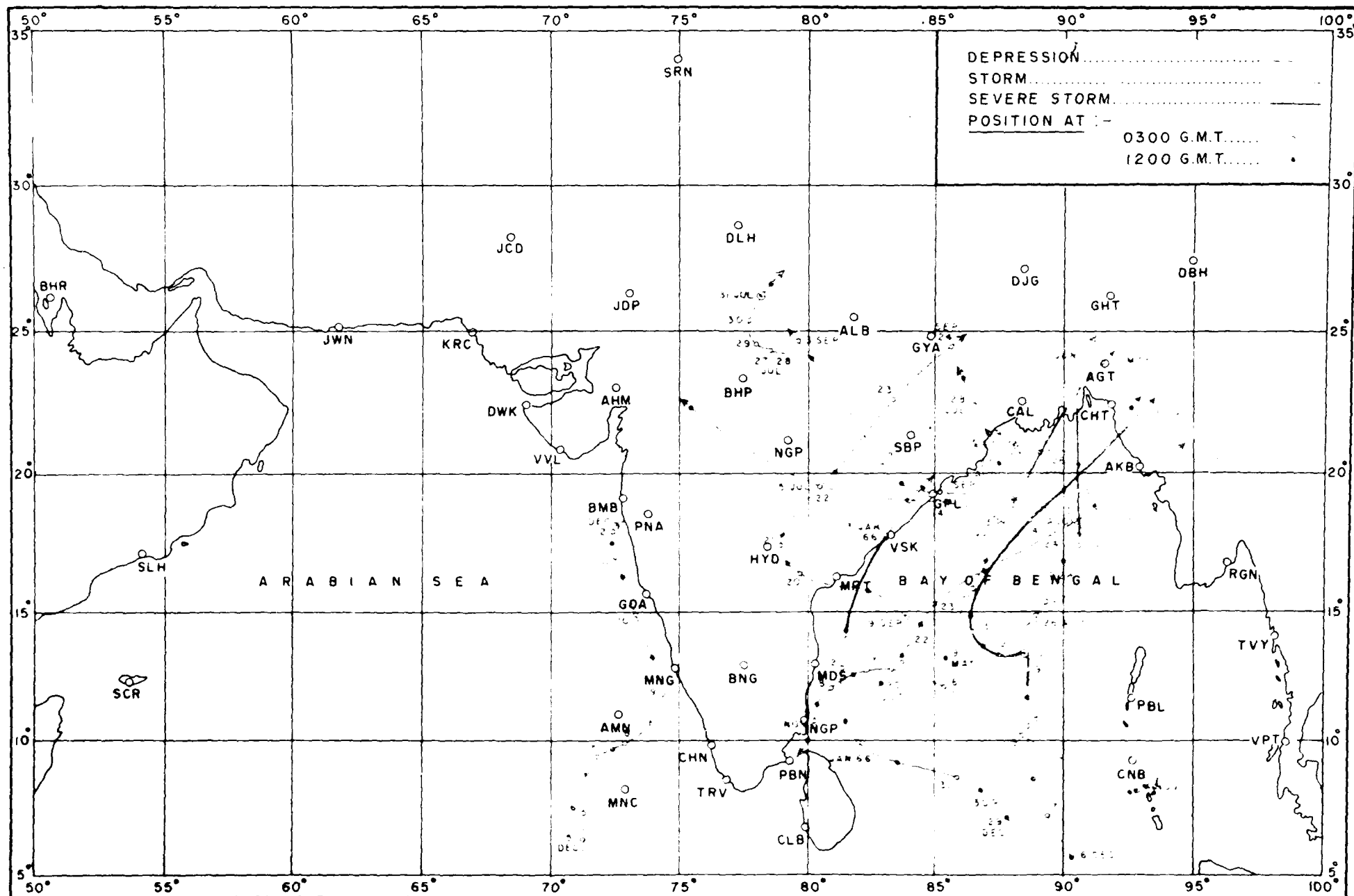


FIG 1